UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/518,693	12/16/2004	Daniele Bigiavi	FE 6028+6088 (US)	3526

34872 7590 08/31/2005

BASELL USA INC.
INTELLECTUAL PROPERTY
912 APPLETON ROAD
ELKTON, MD 21921

EXAMINER	
BOYKIN, TERRESSA M	
ART UNIT	**PAPER NUMBER**
1711	

DATE MAILED: 08/31/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

UD

Office Action Summary	Application No.	Applicant(s)	
	10/518,693	BIGIAVI ET AL.	
	Examiner	Art Unit	
	Terressa M. Boykin	1711	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *16 December 2004*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-21* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-21* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *16 December 2004* is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

35 USC 112, Second Paragraph

Claims 7 and 9 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

The recited "obtained by" is unclear and indefinite because it infers that the objective *can be obtained by* other means, i.e. other than hydrolysis, and thus fails to meet the requirement of the statute that a claim must particularly point out and distinctly claim what applicant regards as his invention.

A suggested phrase may be "produced by" to avoid ambiguity.

35 USC 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1 – 29 are rejected under 35 U.S.C. 103(a) as being unpatentable over US 5804676 see abstract, cols. 2-8 and claims.

The reference states that most of a volatile content can efficiently be removed from a polymer composition by continuously feeding, to a polymerization reactor, a material solution comprising a specific amount of methanol as a solvent, methyl methacrylate alone or a monomer component comprising methyl methacrylate and an alkyl acrylate, a chain transfer agent and a polymerization initiator to carry out polymerization,

continuously drawing a part of a polymerizate, heating it, and then feeding it onto a screw of an extruder through a feed opening substantially maintained at atmospheric pressure. The process of the reference comprises the steps of a material blend step, a polymerization step, a devolatilization step and a volatile content recovery step in this order.

The reference discloses that various processes that employ a devolatizing step. The reference in particular states that the devolatization tank achieves a temperature of 200 degrees or more with falls within or overlaps that which is claimed by applicants. Furthermore, the pressure in the heater depends upon the composition of the volatile content in the polymerizate, the temperature and the feed rate of the polymerizate, a pressure loss by the pipes, the heater and a nozzle, and the like, but any pressure is acceptable, so far as it does not exceed the limit of the pressure resistance of the pipes, the heater and/or the like. Within the reference is mentioned that Japanese Patent Application Laid-open No. 194004/1990 has described a method which comprises mixing a pressurized and molten polymerizate with an extracted gas in a supercritical state, and then reducing the pressure to remove the volatile content from the product. However, in order to apply such a supercritical state to an industrial continuous process, it is necessary to enhance the pressure resistance of an apparatus, which leads to many problems such as the increases in the cost of facilities.

Methanol which can be used as a solvent in the present invention has the following features.

(1) Methanol can completely be dissolved in a monomer component of methyl methacrylate and/or an alkyl acrylate irrespective of temperature, and it also

has a sufficient solubility to a methacrylic polymer at a temperature of 100.degree. C. or more and can maintain the homogeneity of a polymer solution in a wide concentration range. Hence, methanol is desirable as a solvent for a solution polymerization.

(2) When methanol is used, the viscosity of the polymer solution is lower as compared with when a solvent such as an alkylbenzene is used at an equal concentration of the methacrylic polymer.

(3) When a polymerizate containing the solvent is cooled, the solubility of a volatile content in the polymer rapidly decreases. Therefore, the solvent is liable to be separated from the polymer, so that the deposition of the polymer on the inside walls of an apparatus and pipes can be inhibited.

(4) Since the boiling point of methanol is lower than that of the monomer component, the ratio of methanol is higher in a gaseous phase in a polymerization reactor or a reflux cooling line than in a liquid phase, so that the adhesion of scale onto the walls of the reflux cooling line and the like can be suppressed.

(5) Methanol has a relatively low boiling point and is easily volatile, and it can further form an azeotropic mixture having a low boiling point with the methacrylic monomer or the acrylic monomer.

(6) At a temperature of 80.degree. C. or less, methanol scarcely dissolves the methacrylic polymer.

(7) Methanol is produced in large quantities on an industrial scale, and so it is inexpensive and easily available.

By virtue of these features, the amount of the solvent can be reduced by the use of methanol as the solvent, and a stable operation can be done at a heightened polymer concentration in the polymer solution. Furthermore, since methanol can easily be separated from the polymer solution and can form the azeotropic mixture to promote the evaporation of the monomer component, methanol is scarcely contained in the product, in contrast to a solution polymerization method using an alkylbenzene.

Thus, the reference discloses a method for removing volatile components via a process as claimed by applicants except for the particular use of the process for the removal of butene-1 disclosed herein.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to employ the process for the removal of a butene-1 since the reference discloses that other volatile components may be removed other continuous process for preparing polymers.

With regard to claim 29 and the use of a static mixer, it would have been obvious to one having ordinary skill in the art at the time the invention was made to employ the process for the removal of a butene-1 since the reference discloses that other volatile components may be removed other continuous process for preparing polymers.

Consequently, the claimed invention cannot be deemed as unobvious and accordingly is unpatentable.

Correspondence

Please note that the cited U.S. patents and patent application publications are available for download via the Office's PAIR. As an alternate source, all U.S. patents and patent application publications are available on the USPTO web site (www.uspto.gov), from the Office of Public Records and from commercial sources. Applicants may be referred to the Electronic Business Center (EBC) at http://www.uspto.gov/ebc/index.html or 1-866-217-9197.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Examiner Terressa Boykin whose telephone number is

571 272-1069. The examiner can normally be reached on Monday through Friday from 6:30am to 3:00pm.

The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306. The general information number for listings of personnel is **(571-272-1700).**

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

tmb

Terressa Boykin

Examiner Terressa Boykin
Primary Examiner
Art Unit 1711